

PP9. Antimicrobial and anti-inflammatory potential of different immortelle essential-oil chemotypes

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Helichrysum italicum or immortelle (Asteraceae) essential oil has been widely used in alternative medicine for wound healing and other skin conditions such as hematoma and scars. It is possible that the therapeutic efficacy of this oil changes with the natural variability of the composition, i.e. existence of chemotypes, and due to various environmental factors (soil type, altitude, sun exposure, etc.) [1]. Herein we aimed to assess the relationship of the composition and the overall antimicrobial and anti-inflammatory potentials for 4 commercial immortelle oils containing differing amounts of neryl esters (23 : 43 : 12 : 21; oils 1, 2, 3, and 4, respectively), α -pinene (17 : 2 : 20 : 5), γ - and *ar*-curcumenes (19 : 14 : 16 : 15), and β -diketones (3 : 12 : 5 : 7). Oils 3 and 4 displayed higher antimicrobial activity compared to oils 1 and 2, showing a prominent anti-*Staphylococcus aureus* effect (MIC = 0.62 and 0.31 mg/mL, respectively). The tested strains were least susceptible (MIC \geq 5 mg/mL) to the action of oil 1, rich in mono- and sesquiterpenic hydrocarbons. However, this oil, along with oil 3, showed the highest cytotoxicity toward macrophages (LC₅₀ ~ 0.14 mg/mL). Among the oil chromatographic fractions, those enriched in α -pinene and curcumenes displayed the highest cytotoxicity, but were inferior to the toxicity of the oils. The statistical (PCA) treatment of the obtained composition-activity data implied that the observed differences in activities among the tested oils were not only due to the different amounts of the major constituents, but also due to the presence of minor constituents (e.g. 2-methylbutyl angelate in the case of the anti-staphylococcal activity of the oils). Interestingly, based on literature data, the constituents that displayed strong negative correlations in the PCA matrix possess a lower antimicrobial potential than the tested oils. We found that immortelle oil efficiency as antimicrobial and anti-inflammatory agents strongly depends on its composition and is an outcome of synergistic action between its constituents.

References:

[1] Antunes Viegas, D. et al., 2014. *J. Ethnopharmacol.* 151, 54–65.

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